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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/664,862

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Christof Mehler

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NOVAK DRUCE DELUCA + QUIGG LLP

1300 EYE STREET NW

SUITE 1000 WEST TOWER

WASHINGTON, DC 20005

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1795

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/664,862	Applicant(s) MEHLER ET AL.	
	Examiner Jonathan S. Crepeau	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 7-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/21/08 has been entered.

This Office action addresses claims 1, 2, 4 and 7-9. The claims remain rejected over the EP '164 and Thielen et al. references. This action is non-final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 depends on claim 3, which has been canceled. Further, if claim 4 is interpreted as depending from claim 1, then the "6 to 70 wt%" limitation appears to improperly further limit the "10 to 65 wt%" limitation of claim 1. Correction is required.

Claim Rejections - 35 USC § 103

4. Claims 1, 2, 4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1011164 in view of Thielen et al (U.S. Patent 6,331,586).

EP '164 is directed to a PEM fuel cell comprising a separator plate comprising a polymer binder, a powdery carbon filler, and a short fiber (see abstract). The polymer may comprise a variety of materials including polyamide, polyethersulfone, or polyether ketone (see [0018]). The short fiber may comprise carbon fiber and carbon filler may comprise carbon black.

EP '164 does not expressly teach that the binder comprises a polymer blend which includes at least two mutually nonmiscible blend polymers in a co-continuous or intercalated structure, as recited in claim 1.

Thielen et al. is directed to conductive polymer blend having a co-continuous structure (see abstract). The conductive material (e.g., including carbon black and carbon fiber) is substantially localized in one of the polymers (see col. 4, line 15). The blend polymers may comprise a variety of polymers including polyamides and polyethers (col. 6, line 21).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the co-continuous polymer blend of Thielen et al. in the separator plate of EP '164. In column 3, line 24, Thielen et al. state that an object of the invention is "to provide a conductive polymer blend which is suitable for processing by any method, including blow molding," and further state that the polymer blends have "improved mechanical properties." In column 11, line 30, it is taught that "[a] wide variety of articles may be produced from the polymer blends of the invention"

including “components for electronic equipment.” Accordingly, the skilled artisan would be sufficiently motivated to incorporate the polymer blend of Thielen et al. into the separator plate of EP ‘164.

Regarding the composition of the plate recited in instant claim 1, it would be obvious to use at least one polyamide and at least one polyether ketone or polyether sulfone as the blend polymers of Thielen et al. As noted above, EP ‘164 expressly discloses each of these materials, and Thielen et al. teach polyamides as well as polyethers in general. Further, Thielen et al. teach at column 6, line 45, “[i]n general, any pair of polymers may be selected for a blend provided that the two polymers present at least some degree of immiscibility and preferably differ in their polarity.” Accordingly, the artisan would be sufficiently skilled to use the claimed polymers in the blend of EP ‘164.

Regarding the weight ratios recited in claims 1, 4, and 7, it would be well within the skill of the art to vary the specific amounts of carbon black, carbon fiber, and blend polymer(s) to affect the characteristics of the separator plate. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). In this case, the artisan would be able to optimize the conductivity of the plate in light of its mechanical integrity. Thus, it would be obvious to manipulate the amounts of fillers and polymers to amounts encompassed by the claimed ranges.

Response to Arguments

5. Applicant's arguments filed March 21, 2008 have been fully considered but they are not persuasive. Applicants assert that a combination of Saito and Thielen would not result in a bipolar plate comprising a polymer blend having a carbon black content of 10-65 wt%. In particular, it is asserted that Thielen teaches very low amounts of carbon black, on the order of 1 wt%. However, it is first noted that the disclosures of specific filler amounts are contained in the Examples of Thielen et al., and thus constitute preferred embodiments. Thielen et al. do not appear to give any guidance as to a specific range of content for the carbon material. Rather, in column 10, line 35, Thielen et al. teach that "[b]y appropriate selection of the type of finely divided conductive material and its amount, the natures of the polymers constituting the respective con-continuous phases and their relative proportions, [...] a conductive polymer blend may be obtained which retains [...]". Thus, it is seen that Thielen et al. do not restrict the carbon content or otherwise "teach away" from a content over 10 wt%, as claimed. Regarding the Saito reference, it is further noted that this reference teaches carbon contents significantly over 10 wt% in paragraph [0026]. In fact, the artisan may reasonably conclude that using the polymer blends of Thielen in the plate of Saito would allow the carbon content of Saito to be advantageously reduced, thereby allowing for a savings in material.

The remainder of Applicant's arguments are substantially cumulative of arguments previously set forth. In this regard, the Examiner's remarks from the "Response to Arguments" section in the previous Office action remain applicable and are reiterated herein. In particular, the position is maintained that with regard to the polymer combination, it would be within the

skill of the art to choose from a finite number of identified, predictable solutions, with a reasonable expectation of success. *KSR v. Teleflex*, 82 USPQ2d 1385, 127 S. Ct. 1727 (2007). Applicant has not provided any convincing rationale or evidence that the claimed combination would yield an unpredictable or unexpected result. On page 11 of the remarks, Applicant asserts that unexpected results have been shown. However, as stated in the previous Office action, it is noted that Applicant's statements are not substantiated by any evidence, and arguments of counsel cannot take the place of factually supported objective evidence (MPEP 2145). Applicants state that "a skilled artisan had no way to predict that this very specific combination could yield a bipolar plate for PEM fuel cells with a significantly improved stability against peroxide anions. No evidence to the contrary has been produced." However, the burden of proof to provide "evidence to the contrary" does not lie with the PTO. It is incumbent on Applicants to show evidence to support the assertion that one specific combination of polymers unexpectedly outperforms other combinations of polymers. Further, as previously stated, the blend of polyethylene and polystyrene cited by Applicant is not believed to be the closest comparison vis-a-vis Thielen et al.

Similar arguments apply to Applicant's assertion that the claimed combination allows a PEM fuel cell to be operated a higher permanent temperature. The position is maintained that the melting points of the polymers can easily be taken into account when designing a plate appropriate for PEM fuel cell operating conditions, and even if it could be shown that the claimed polymer combination allows a fuel cell to be operated at a higher permanent temperature, this result would be expected based on the melting points of the individual

polymers. Accordingly, the rejection over Saito and Thielen et al. are believed to be proper and are maintained.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795
April 10, 2008